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# DMS-6140

## Polymer Concrete for Bridge Joint Systems

Effective Date: **November 2019**



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### 1. DESCRIPTION

This Specification governs for the Quality Monitoring Program (QMP) for polymer concrete bridge joint systems. This Specification also describes the requirements and procedures for the QMP and describes the material requirements for the polymer concrete.

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### 2. UNITS OF MEASUREMENTS

The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

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### 3. MATERIAL PRODUCER LIST

The Materials and Pavements Division maintains the Material Producer List (MPL) of all materials conforming to the requirements of this Specification. Materials appearing on the MPL, entitled "[Polymer Concrete](#)", require no further sampling and testing before use, unless deemed necessary by the Project Engineer or Materials and Tests Division.

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### 4. BIDDERS' AND SUPPLIERS' REQUIREMENTS

The Department will only purchase or allow on projects those products listed by producer and product code or designation shown on the MPL.

Use of pre-qualified product does not relieve the Contractor of the responsibility to provide product that meets this Specification. The Department may inspect or test material at any time and reject any material that does not meet the specifications.

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### 5. PRE-QUALIFICATION PROCEDURE

5.1. **Pre-Qualification Request.** Submit a request for evaluation under DMS-6140 to [DMS\\_Prequal@txdot.gov](mailto:DMS_Prequal@txdot.gov).

Include the following information in the request:

- company name;
- physical and mailing addresses;
- contact person, phone number, and email address;
- a laboratory test report for the batch of material being submitted for evaluation with data showing the compliance of the material with the requirements listed in 6140.6.

5.2. **Pre-Qualification Sample.** Submit a minimum of at least one sample (at least 1/2 gal. of each component with corresponding aggregate) for each type of polymer concrete to be considered to the Texas Department of Transportation, **Materials and Tests Division** (CP51), 9500 North Lake Creek Parkway, Austin, Texas 78717.

Include the following with the sample:

- current Safety Data Sheet (SDS) that complies with OSHA Hazard Communication Standard 29 CFR 1910.1200,
- mixing Instructions that include the component mixing ratio, aggregate to binder ratio, and if a primer is required or recommended.

Submit all materials for pre-qualification at no cost to the Department.

5.3. **Evaluation.** Materials and Tests Division will notify prospective bidders and suppliers after completion of material evaluation.

5.3.1. **Qualification.** If approved for Department use, Materials and Tests Division will add the material to the MPL.

Pre-qualification will only be considered for materials with an established history of performance in the field. Prospective suppliers may be required to install their material at a test location. The Department must approve test sections before installation. The manufacturer, supplier, or their representative will provide materials and installation for a test site. Materials and Tests Division will monitor the test location for a minimum period of 12 mo., unless the material fails prematurely.

Materials and Tests Division will attempt to establish adequate correlation between producer and Materials and Tests Division test results. If approved for use by the Department, the material will be accepted to the QMP and added to the MPL.

Once in the QMP, report any changes in the composition or in the manufacturing process of any material to Materials and Tests Division. Any changes in the material require resubmission for prequalification. The Department reserves the right to conduct whatever tests it deems necessary to identify a pre-qualified material and determine if there is a change in the composition, manufacturing process, or quality that may affect its durability or performance. In case of variance, the Department's tests will govern.

5.3.2. **Failure.** Producers not qualified under this Specification may not furnish materials for use on Department projects.

Producers failing to qualify may submit a request for re-evaluation. In the request for re-evaluation, document the cause of the issue and corrective action taken.

Materials and Tests Division will reject the material if a correlation is not established between producer and Materials and Tests Division test results, if the material does not meet the requirements, or if the material fails to perform in the field.

The Department normally bears the costs of sampling and testing; however, the producer will bear the costs associated with materials failing to conform to the requirements of this Specification. The Director of Materials and Tests Division will assess this cost at the time of testing, and amounts due will be billed to the producer.

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## 6. QUALITY MONITORING REQUIRMENTS

Materials in the QMP must be pre-qualified every year. The pre-qualification period will begin when Materials and Tests Division qualifies the pre-qualification sample and will expire one year from that date. During each pre-qualification period, the producer must provide monthly quality control (QC) testing reports.

6.1. **QM Sample.** The producer must submit a sample of each pre-qualified material every year to Materials and Tests Division for testing. Producers should submit sample at least one month before the expiration date of

pre-qualification to allow sufficient time for testing. Any material not submitted on time may be delayed in posting on the MPL.

- 6.2. **QC Testing Reports.** The Department requires that all producers in the QMP perform QC testing on their material. Testing is required for every material that is pre-qualified under the QMP.

The Department requires that producers submit QC testing reports to Materials and Tests Division every month. The report should reflect the test data from each batch of pre-qualified polymer concrete produced during that month regardless of the destination of the material. The monthly report should contain the following information:

- type of polymer concrete,
- date of manufacture,
- batch number, and
- QM test results.

Producers should submit reports by the first business day of every month. If no pre-qualified polymer concrete is produced for a particular month, then submit a report stating no polymer concrete was produced.

- 6.3. **Periodic Evaluation.** The Department reserves the right to conduct random sampling and testing of pre-qualified materials to verify performance and Specification compliance and to perform random audits of documentation. Department representatives may sample material from the manufacturing plant, the project site, and the warehouse. Materials and Tests Division reserves the right to test samples to verify compliance with this Specification.

Failure of materials to comply with the requirements of this Specification as a result of periodic evaluation may be cause for removal of those materials from the MPL. In case of variance, the Department's tests will govern.

- 6.4. **Disqualification.** The Department may remove the producer or supplier from the QMP if one of the following infractions occurs:

- material tested by Materials and Tests Division fails to meet the requirements stated in this Specification,
- producer fails to properly submit complete monthly QC testing reports or pre-qualification sample to Materials and Tests Division,
- producer fails to report changes in the formulation or production process of the material to Materials and Tests Division,
- producer has unpaid charges for failing samples or
- producer fails to comply with this Specification.

If Materials and Tests Division disqualifies a material, the producer will not be allowed to supply material to the Department for 6 months or as determined by the Director of Materials and Tests Division. After this period has expired, the producer must re-qualify to regain QMP status. Disqualification will only apply to the polymer concrete type corresponding to the infraction.

- 6.5. **Re-Qualification.** If a producer desires to re-qualify after this disqualification period, the producer must first submit a request to Materials and Tests Division and include a test report with data certifying that the polymer concrete meets the material requirements in this Specification. Once accepted, all procedures and requirements as stated in Article 6140.5 will apply.

## 7. MATERIAL REQUIREMENTS

Four types of polymer concrete are described. All types consist of a two-component binder and an aggregate system that when blended will form a mortar for nosing or joint repair.

- Type I is a polyurethane-based polymer concrete.
- Type II is an epoxy-based polymer concrete.
- Type III is a polyester-based polymer concrete.
- Type IV is a vinyl polymer-based polymer concrete.

7.1. **General Requirements.** All types of polymer concrete have the following properties:

- After completion of mixing, the polymer concrete has a working time of at least 5 min. at 80°F (27°C).
- The consistency is self-leveling to moderately stiff, flow-able, and hand trowel-able.
- The polymer concrete must be able to carry traffic within 3 hr. of placement.
- The polymer concrete is resistant to chemicals, weather, and abrasion.
- The aggregate types used are those specified by the manufacturer.
- Do not install polymer concrete at temperatures below 50°F (10°C).

7.2. **Binder Requirements.** Binder components are tested without the aggregate system. The binder system must meet the requirements of Table 1.

Table 1

Binder Requirements					
Property	Test Method	Type I	Type II	Type III	Type IV
Gel Time, min.	Tex-614-J	5 Min	5 Min	5 Min	5 Min
Tensile Strength, psi (MPa)	Tex-618-J	500 (3.4) Min	900 (6.2) Min	2,500 (17.2) Min	5,000 (34.5) Min
Ultimate Elongation, %	Tex-618-J	100 Min	40 Min	8 Min	5 Min

7.3. **Complete Binder-Aggregate Mixture.** The binder system must meet the requirements of Table 2.

Table 2

Complete Binder-Aggregate Mixture Requirements					
Property	Test Method	Type I	Type II	Type III	Type IV
Wet Bond Strength to Concrete, psi (MPa)	Tex-618-J	225 (1.55) Min	225 (1.55) Min	225 (1.55) Min	225 (1.55) Min
Compressive Strength @ 24 hr., psi (MPa)	ASTM C 579, Method B	750 (5.2) Min	2,000 (13.8) Min	4,500 (31) Min	4,000 (27.6) Min
Compressive Stress @ 0.1 in., psi (MPa)	Tex-618-J	750 (5.2) Min	2,000 (13.8) Min	4,500 (31) Min	4,000 (27.6) Min
Resilience, %	Tex-618-J	85 Min	70 Min	90 Min	90 Min

7.4. **Packaging and Labeling.** Package components in airtight containers and protect from light and moisture. Include detailed instructions for the application of the material and include all safety information and warnings regarding contact with the components.

7.5. Labels must include the following information:

- Name of manufacturer,
- brand name,
- resin or hardener components,
- ratio of components to be mixed by volume,
- unique batch number,
- temperature range for storage,
- date of manufacture, and
- expiration date of polymer concrete.

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## 8. **ARCHIVED VERSIONS**

Archived versions are available.